

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

**FISHPOND MANAGEMENT
TEXAS SUPPLEMENT**

(no.)

Code 399

Pond Construction

Refer to Pond Standard (Texas Addendum) Section IVB, FOTG. Criteria are contained for drainage area, reservoir area, embankment ponds, excavated ponds, and non-commercial fishponds. Additional criteria for non-commercial fishponds are surface area, minimum depth, shoreline development, emergency spillways, drain pipes, trickle tubes, and woody vegetation.

Stocking

This supplement addresses two types of stocking - initial and corrective (stocking to solve an existing population imbalance).

Public agencies have not provided fish for stocking private waters in Texas since the early 1980's. Private fish producers are the primary source of fish for pond stocking. Costs and availability of species are important when developing stocking recommendations. Texas Aquaculture Association updates and distributes a list biannually of its members who sell fish for stocking. NRCS offices are encouraged to supplement this list with fish suppliers not included.

"Bass" as used in this supplement includes northern (Texas) largemouth bass, Florida largemouth bass, and hybrid largemouth bass.

Consult with zone wildlife biologist before including crappies, tilapia, threadfin shad, hybrid sunfish, hybrid striped bass, flathead (yellow) catfish or blue catfish in fishpond management plans. These species require management guidance not included in this supplement.

Initial Stocking: Initial stocking includes new ponds and renovated ponds (unbalanced fish populations eradicated). Eradicate fish from all standing water immediately after completion of construction or renovation, when unwanted fish are suspected.

The following key is designed to assist in determining numbers of fish to stock based on (1) pond size, (2) fish species desired, (3) water clarity (muddiness), (4) total hardness, and (5) pond surface fluctuation.

Alkalinity, total hardness, and pH are three parameters measured in determining productivity of pond waters. Total hardness has been selected as the productivity parameter for the following key. Waters to be stocked should be sampled for total hardness. In the absence of this information, individuals knowledgeable of surface water quality in the vicinity should be consulted. (For additional details refer to BIOLOGY TECHNICAL NOTE NO. TX-2, "Use of pH, Alkalinity, and Hardness Measurements in Fishpond Management").

Key

Factor	Step
1. Choose suitable species on basis of pond size	
a. Ponds less than one surface acre	Go to 2
b. Ponds greater than one surface acre	Go to 3
2. Ponds less than one surface acre	
a. Fish unfed or occasionally fed Stock 100 channel catfish per acre and 500 fathead minnows per acre	Go to 6
b. Fish fed daily, emergency aeration facilities not available. Stock up to 500 channel catfish.	STOP
c. Fish fed daily, emergency aeration facilities available. Stock up to 1,000 channel catfish per acre.	STOP
3. Ponds greater than one surface acre	
a. Channel catfish - Best choice for muddy ponds.	Go to 2
b. Channel catfish and bass	
(1) Channel catfish - Stock 100 per acre (channel catfish must be longer than bass).	
(2) Bass	
(a) Stock 20 advanced bass per acre. Advanced bass are 6-8 inches long.	
or	
(b) Stock 50 fingerling bass per acre. Fingerling bass are 1-3 inches long.	Go to 4
4. Forage selection	
a. Pond muddy (less than 12 inches underwater visibility)	Go to 2
Pond clear (more than 12 inches underwater visibility)	Go to 4b
b. Pond clear	
Low total hardness [20 ppm (mg/L) or less]	Go to 4c
Moderate and high total hardness [20 ppm (mg/L) or more]	Go to 4d

c. Low total hardness

- (1) Stock 15 adult bluegill sunfish **and** 15 adult redear sunfish per acre. Adult sunfish are longer than 3 inches.

or

- (2) Stock 250 fingerling bluegill sunfish **and** 250 fingerling redear sunfish per acre. Fingerling sunfish are 1-3 inches long.

Go to 5

d. Moderate and high total hardness

Pond surface fluctuates more than 25 percent annually.

Go to 4e

Pond surface fluctuates less than 25 percent annually.

Go to 4f

e. Pond surface fluctuates more than 25 percent annually.

- (1) Stock 30 adult bluegill sunfish **and** 500 golden shiner per acre.

or

- (2) Stock 500 fingerling bluegill sunfish **and** 500 golden shiner per acre.

Go to 5

f. Pond surface fluctuates less than 25 percent annually.

- (1) Stock 30 adult bluegill sunfish per acre.

or

- (2) Stock 500 fingerling bluegill sunfish per acre.

Go to 5

Optional: Bluegills may be supplemented with 500 golden shiner per acre.

5. Time of forage stocking

- a. Stock fingerling sunfish and shiners in the spring.
Stock fingerling bass the following spring.

Go to 6

- b. Stock adult sunfish and shiners in the fall.
Stock fingerling bass the following spring.

Go to 6

6. Fertilized ponds

If an annual fertilization program will be conducted, double all stocking rates. Do not fertilize muddy ponds.

STOP

Corrective Stocking: When pond has excessive numbers of 3-5 inch sunfish, stock twenty five 8-12 inch bass per surface acre. Do not remove any bass until 3-5 inch sunfish and 6-8 inch sunfish are harvested in approximate equal numbers.

When pond has excessive numbers of 8-12 inch bass and few 3-6 inch sunfish, stock fifty 3-5 inch sunfish per surface acre. Remove about twenty five 8-12 inch bass per surface acre each year until 8-12 inch bass are less abundant and 6-8 inch sunfish are regularly harvested.

Stock 8-10 inch channel catfish into ponds with established bass populations.

Proper Harvest

Bass - Sunfish: For three years after stocking, return all bass less than 15 inches long to the pond.

After the third year, return all bass longer than 12 inches but shorter than 15 inches to the pond. Remove at least 25 bass less than 12 inches long each year per surface acre of water.

Channel Catfish: Begin harvest after fish average 12-15 inches (3/4 to 1 pound) in size). An accurate record should be kept of the total number of catfish removed so pond can be restocked after 50 percent of initial stocking has been removed.

Additional Management Practices

Pond Fertilization

Proper fertilization promotes growth of planktonic (microscopic) algae which reduces growth of submerged aquatic weeds, increases dissolved oxygen concentrations and increases carrying capacity for bass/bluegill populations.

Fertilizer rate: Granular - Use 100 pounds per surface acre per application of a fertilizer with a high phosphate component, i.e., 10/20/10.

Liquid - Use 2 gallons of 10/34/0 per surface acre per application.

Addition of 200 to 500 pounds of organic matter, such as alfalfa hay or cottonseed meal, per surface acre may be necessary initially to develop plankton bloom.

Application Method: Start fertilizing at the first of the growing season when water temperatures reach 60 degrees Fahrenheit.

Bags of granular fertilizers should be opened along the long side and laid flat, submerged in shallow water, to allow water currents to dissolve the granules. Mix each gallon of liquid fertilizer with 5 gallons of water and apply to the pond at 2-week intervals.

When a green color (plankton bloom) develops that restricts underwater visibility to 15 inches, discontinue fertilization until the green color diminishes, permitting underwater visibility at 20 inches. Fertilize again to restore desirable plankton bloom.

Follow this fertilization guidance throughout the entire growing season until water temperatures decrease below 60 degrees Fahrenheit.

Program Efficiency: Determine total hardness prior to fertilization and liming. Use fertilizer recommendation and lime at a rate of 2 tons of agricultural lime per surface acre, if total hardness is less than 20 ppm (mg/L). Apply 1 ton of lime per surface acre for total hardness greater than 20 ppm (mg/L) and less than 50 ppm (mg/L).

Do not fertilize ponds with excessive shallow water (> 15% surface area < 3 feet deep).

Do not fertilize muddy water.

Do not fertilize waters with established aquatic weed/ algal populations.

Begin fertilizing new ponds as soon as they fill with water if it is during the growing season.

Supplemental Feeding

This practice is essential for adequate performance from ponds stocked with only

channel catfish. While fathead minnows provide forage for channel catfish, supplemental feeding is desirable. Largemouth bass normally will not eat supplemental feed, forage species will. Bass will benefit from the resulting increase in forage production. Note: largemouth bass can be trained as fingerlings to eat supplemental feed. Trained bass may be purchased and stocked, but their spawns should not be expected to eat supplemental feed.

Feed a good commercial feed with the following analysis:

32-36 percent protein

> 5 percent fat

10-15 percent fiber

> 8 percent fish meal

For desirable growth and weight gain, feed a minimum of 5 days a week, once a day. Feed amount fish will clean up in 20 minutes.

Feed regularly when water temperatures are above 60 degrees Fahrenheit. During warm periods in winter, feed if fish will eat.

Aquatic Vegetation Management

Correct identification of the problem plant is essential before selecting a management option. Texas Agricultural Extension Service maintains an Internet web site, Aquaplant (<http://wildthings.tamu.edu/aquaplant/>), to assist in identifying aquatic plants and selecting management options for their control.

Elimination of shallow water (<3 feet deep) during construction and proper pond fertilization is the preferred method.

Where annual rainfall is sufficient for reliable spring refilling (>40 inches of average annual precipitation), draw the water level down in the fall, exposing 1/3 to 1/2 of the basin. Maintain draw down through winter and allow to refill next spring. This technique can be improved by sowing a cool season cover crop in the exposed area.

NRCS policy for use of algaecides/herbicides in fishponds is contained in General Manual 190, Part 404 - Pesticides dated May 1981. In order for a chemical to be recommended by NRCS personnel, it must fulfill all of the following criteria:

Federal registration

Permitted by state regulation

Instructions for use where fish are being grown for human consumption.

Applications of algaecides/herbicides to control floating and submerged plants should be made in the spring with cool water temperatures. If treatment must be made when water temperatures are above 70 degrees Fahrenheit, treat no more than 1/3 of the surface area at one time if granular formulations are used. Treat with 1/2 the recommended rate when liquids, wettable powders or water-dispersible granules are used. If vegetation has not been affected after 2 weeks, treat again. If necessary, follow the same procedure and treat a third time. The procedures are necessary to avoid oxygen depletion.

Hybrid grass carp may be stocked to control submerged plants. However, they exhibit a preference for different species. The problem vegetation should be correctly identified. Then, a Triploid Grass Carp Permit must be obtained from Texas Parks and Wildlife Department to legally purchase and stock these fish.

As a condition to their Triploid Grass Carp Permit, Texas Parks and Wildlife Department often requires that spillways be fitted with fish guards to prevent triploid grass carp from escaping during spillway flows. These guards can catch trash and debris that will accumulate, interfering with storm flows and placing the dam at risks. If installed, these guards should be cleaned regularly.

In many instances aquatic vegetation may be desirable for maintaining a balanced fish population and enhancing fishing success. Where largemouth bass is the client's principal objective, and aquatic vegetation

covers less than 20 percent of the pond area, control may not be necessary. Where catfish are the principal species, aquatic vegetation should always be controlled.

Pond Renovation

Catfish ponds that have become infested with bullheads, green sunfish, European carp or gar should be renovated. Population imbalances in largemouth bass ponds can usually be corrected through corrective stocking and harvest adjustments, but sometimes the only remedy is renovation and restocking.

Use rotenone with at least 5 percent active ingredient when removing unwanted fish populations.

In the liquid form, apply 3 pints per acre-foot. In the powdered form, apply 3 pounds per acre-foot.

When species are present that are more resistant to rotenone, apply 6 pints per acre-foot or 6 pounds per acre-foot. Examples are bullhead, green sunfish, gar, and bowfin.

Renovate while water temperatures are above 70 degrees Fahrenheit.

Minimize water depths in excess of 5 feet.

Wait 2 weeks before restocking.

Muddy Water

Insure that drainage area is properly vegetated. If problem still persists, check for presence of bottom feeding species, such as European carp and bullheads. If present, eradicate these fish. If muddiness persists and livestock utilize pond, fence to exclude livestock. If muddiness persists alum, gypsum or lime may clear the water (see BIOLOGY TECH NOTE NO. TX-12, "Removing Clay Turbidity in Farm Ponds").

Spawning Devices

Do not encourage spawning of channel catfish when stocked alone because

overpopulation usually results. When channel catfish are stocked with bass, most recruitment will be eaten by bass.

Provide spawning structure for fathead minnows and golden shiner in spring and early summer. Lumber yard pallets or sections of sewer field drain pipe submerged in water <3 feet deep provide excellent spawning substrate for fathead minnows. Golden shiner will spawn on blocks from square hay bales placed in shallow water.

REFERENCES

Biology Technical Notes

TX-1, "Water Quality for Catfish Production"

TX-2, "Use of pH, Alkalinity, and Hardness Measurements in Fishpond Management"

TX-5, "Identification of Sunfishes"

TX-6, "Use of Liquid Fertilizer in Fishpond Management"

TX-7, "Use of 'Aquathol' and Hydrothol 191' Aquatic Herbicides"

TX-8, "A Table of Aquatic Herbicides Approved for Use in Texas"

TX-9, "Identifying Texas Catfishes"

TX-12, "Removing Clay Turbidity in Farm Ponds"

Biology Job Sheets

TX-1, "Transporting Fish for Fishpond Stocking"

TX-4, "Pond Fertilization"

TX-5, "Chemical Control of Algae in Farm Ponds"

TX-10, "Rotenone"

TX-11, "Chemical Control of Emergent Aquatic Vegetation Around Farm"

TX-13, "Clearing Muddy Ponds"

Other

_____. 1999. Texas farm ponds: stocking, assessment, and management recommendations. Special Publication No. 1, Texas Chapter, American Fisheries Society. 15 pp.

_____. _____. Inland aquaculture manual for county extension agents. Texas Agriculture Extension Service. County Offices.

_____. _____. Pond management handbook. Texas Agricultural Extension Service, County Offices.

APPROVAL:

/s Gary Valentine

State Wildlife Biologist

Zone Wildlife Biologist

June 18, 2001

Date

Date

STATEMENT OF NEED:

This practice is needed in the

_____ FOTG.

Zone Wildlife Biologist

Date

Resource Team Leader (D.C.)

Date

Zone Wildlife Biologist

Date

CERTIFICATION:

Reviewed and determined adequate without
need of revision:

Zone Wildlife Biologist

Date

Zone Wildlife Biologist

Date